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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,529	10/08/2003	Robert E. Stewart	NGC-138/000209-199	7493

32205 7590 12/22/2005

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EXAMINER	
DRYDEN, MATTHEW DUTTON	
ART UNIT	**PAPER NUMBER**
3736	

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

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Office Action Summary	**Application No.** 10/681,529	**Applicant(s)** STEWART, ROBERT E.
	Examiner Matthew D. Dryden	**Art Unit** 3736

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/8/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/27/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

Priority has been claimed back to provisional application 60/418119 filed on October 11, 2002. Claim 17 involving the supplementary navigation components being integrated into a shoe of the individual is not given the priority date of October 11, 2002 because there is no mention of a shoe in the provisional application.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Joint Motion Sensing Apparatus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kovacevic (5469862).

Regarding claim 1, Kovacevic teaches a range of motion analysis system comprising:

a sensor that produces one or more signals based on one or more joint motions of an individual (see Column 2, lines 47-55, and around element 16 in Figure 1),

a processing component that employs the signal received from a sensing component to make a determination of a positional change of the individual (see column 4, lines 21-33).

Regarding claim 2, the apparatus of Kovacevic has a plurality of strain sensors, see Column 4, lines 7-20.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Stark et al (5929782).

Regarding claim 1, Stark et al teaches an orthopedic device that consists of:

A sensor that produces a signal based on joint motion (elements 8a and 8b, Figure 1),

A processing component that is capable of employing the signal to make a determination of a positional change of the individual, see Column 17, lines 1-37.

Regarding claim 2, the sensors mentioned above are strain sensors, see Column 17, lines 16-18.

Regarding claim 3,

the sensors discussed above are located adjacent the knee joint as can be seen in Figure 11,

the sensors experience a strain in response to the knee joint motion and represent the strain as strain information in a signal and the apparatus translates the strain information into the positional change of the individual, see Column 22-23, lines 29-10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al in view of Danisch (6127672). Stark et al discloses the claimed invention except for the apparatus comprising: a strain sensor that detects a bending of a joint and the sensor representing the bending as strain information, the strain sensor detecting a twisting of a joint of the individual, and an apparatus comprising both a bending sensor and a twisting sensor used to determine the displacement of the individual. Danisch discloses a topological and motion measuring tool that comprises both bending sensors and twisting sensors that are strain sensors that provide signals to determine the position and displacement of the person or object wearing the sensors (See Columns 10-11, lines 54-15). The purpose of providing the bending and twisting sensors in the same apparatus is to allow the user to monitor the wearer of the apparatus, and increases the validity of the location and path taken by the wearer, which in turn allows for more efficient and accurate analysis. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with bending and twisting strain sensors, as taught by Danisch, to allow the user to monitor the wearer of the apparatus, and increases the validity of the location and path taken by the wearer, which in turn allows for more efficient and accurate analysis.

Claims 7-9, 10, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al, in view of Soehren et al (6522266). Stark et al discloses the claimed invention except for the apparatus comprising: a filter component that weighs and combines a positional change determined by the processing components and position information from one or more supplementary navigation components, the supplementary navigation components comprising GPS or INS, the processing components receiving position correction information from the supplementary navigation components, an initial position location supplied to a supplementary navigation component, a magnetic heading sensor, and the system calculating an updated position of the individual. Soehren et al discloses a navigation system that uses a Kalman filter that receives a first position and a change in position, detected by motion sensors, and are weighed and combined accordingly (see Columns 3-4, lines 39-65, specifically Column 4, lines 31-65). The motivation for providing a filter that weighs and combines the positional change and position information is to provide the user of the system a way to monitor their progress and efficiency, and provides a filter to help estimate the geolocation of the user if one aspect of the apparatus were to stop functioning. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with a filter component that weighs and combines a positional change determined by the processing components and position information from one or more supplementary navigation components, as taught by Soehren et al, to provide the user of the system a way to monitor their progress and efficiency, and provides a filter to help estimate the geolocation of the user if one aspect of the apparatus were to stop functioning.

Regarding claim 8, Soehren et al also teaches to provide a supplementary navigation component that comprises GPS, and the filter component weighs and combines position information from the processing components and the supplementary navigation components based on a relative reliability, (see Columns 5 and 6, lines 33-7, regarding reliability see Column 3, lines 39-54). The motivation for providing a supplementary navigation component and having the filter weigh and combine position information from the processing components and the supplementary navigation components is to provide the system with a more efficient locator and position monitor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al, with a filter component that weighs and combines position information from the processing components and the supplementary navigation components based on a relative reliability, as taught by Soehren et al, to provide the system with a more efficient locator and position monitor.

Regarding claim 9, Soehren et al teaches it is known to detect position correction information from the one or more supplementary navigation components (see Column 5, lines 54-59) to provide the system with a corrected location to be analyzed based on the initial location and path of the wearer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with a processing component that receives position correction information from the supplementary navigation component, as taught by Soehren et al, to provide the system with a corrected location to be analyzed based on the initial location and path of the wearer.

Regarding claim 10, Soehren et al teaches that it is known to provide a motion monitoring system with a supplementary navigation component (INS or GPS) that receives initial position information of the individual (See Column 5, lines 20-33), to provide the system with a starting point so the distance traveled and the rate of the individual can be tracked using the apparatus. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with a supplementary navigation component (INS or GPS) that receives initial position information of the individual, as taught by Soehren et al, to provide the system with a starting point so the distance traveled and the rate of the individual can be tracked using the apparatus.

Regarding claim 12, Soehren et al teaches that it is known to provide a motion monitoring system with a magnetic sensor for direction heading (Column 5, lines 20-32), to provide directional information that can be used by the Kalman filter to determine positional changes and the location of the wearer. It would have been obvious at the time the invention was made to modify the device of Stark et al with a magnetic sensor for direction heading, as taught by Soehren et al, to provide directional information that can be used by the Kalman filter to determine positional changes and the location of the wearer.

Regarding claim 15, Soehren et al teaches that it is known to provide a motion monitoring system with a calculated and updated position of the individual based on a starting point and the positional change of the individual and is sent to a display component (see Columns 5-6, lines 60-7) to provide the user and wearer with a record of the distance and path traveled and to allow for further analysis once the final position is detected. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with a calculated and updated position of the individual based on a starting point and the positional change of the individual and is sent to a display component, as taught by Soehren et al, to provide the user and wearer with a record of the distance and path traveled and to allow for further analysis once the final position is detected.

Claims 13, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al in view of Root et al (6013007). Stark et al discloses the claimed invention except for: the apparatus comprising a barometric altitude sensor, the device being calibrated by or for the user, and one of the sensing components comprising a rate sensor. Root et al discloses a monitoring system that includes: calibrating the apparatus (see Column 6, lines 63-66), regarding the rate sensor the GPS system has a sensor capable of determining the speed of the user which can be viewed as a rate sensor (see Column 7, approx. lines 30-40), barometric pressure sensor (See Column 4, lines 50-54). The purpose of including all of these components is to increase the accuracy of the system in determining the location of the wearer, which helps in analysis of the motions of the wearer's joints and body. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Stark et al with a calibration done by the wearer, a rate sensor, and a barometric sensor, as taught by Root et al, to increase the accuracy of the system in determining the location of the wearer, which helps in analysis of the motions of the wearer's joints and body.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kovacevic in view of Jayaraman et al (6381482). Stark et al discloses the claimed invention except for the one or more sensors being integrated into a suit wearable by the individual. Jayaraman et al teaches a fabric or garment that has sensors integrated inside the fabric to monitor a specific medical condition of the wearer (see abstract). The purpose of providing a suit or other garment is to provide the user with a comfortable outfit that tracks both movement and location without having to strap any bulky equipment to their body. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kovacevic with a suit having integrated sensors, as taught by Jayaraman et al, to provide the user with a comfortable outfit that tracks both movement and location without having to strap any bulky equipment to their body.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al in view of Root el al as applied to claim 16 above, and further in view of Jamel et al (6788200). Stark et al as modified discloses the claimed invention except for the supplementary navigation components being integrated into the shoe of the wear and initiating one or more zero velocity updates. Jamel et al teaches a pair of shoes that have a global positioning system in them and that is capable of initiating zero velocity updates, for whenever the user stops moving (see Columns 9-10, lines 54-5), to allow for a better measurement of velocity over the distance traveled and so that the wearer's step width can be determined. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Stark et al with a shoe that includes GPS that initiates a zero velocity updates, as taught by Jamel et al, to allow for a better measurement of velocity over the distance traveled and so that the wearer's step width can be determined.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al. Stark et al discloses the claimed method steps except for specifically stating measuring one or more movements of a joint of an individual. The method step is not explicitly stated but is implied when the strain sensors are talked about along with the components of Figure 15, see specifically Columns 22-23 lines 29-10. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Stark et al with a method step including a step for measuring a movement of a joint of the individual to monitor both the location and functionality of a desired joint over an extended period of time, for analysis and extrapolation.

Regarding claims 19 and 20, see Column 22 lines 29-47.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stark et al as applied to claim 18 above, and further in view of Soehren et al. Stark et al discloses the claimed method steps except for adding the positional change of the individual to a known starting location to determine an updated position. Soehren et al discloses a motion monitoring system that teaches it is known to provide a start position with positional change information, to determine an updated location of the wearer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Stark et al with a step of providing positional change information to the starting location, as taught by Soehren et al, to determine an updated location of the wearer.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jayaraman et al in view of Stark et al. Jayaraman et al teaches the disclosed invention except for the invention measuring one or more movements of a joint in the individual and translating the movement into a positional change. Jayaraman discloses an article (see Figure 11) that transmits signals that are received by receivers coupled to data buses, and the garment is also provided with a receiver portion on the garment (See Column 15 lines 30-67), which also comprises a chip that can be viewed as a computer readable medium. As defined by the applicant in the specification the computer readable medium comprises a modulated carrier signal transmitted over a network, which the invention of Jayaraman et al does through the chips in the garment. Stark et al discloses an orthopedic system for position sensing that teaches to monitor a joint (specifically the knee) and determine the position based upon the strain gage adjacent the knee. The purpose of providing a computer readable medium and position determination component on an article of clothing is so that the movement of the wearer can be interpreted and monitored along with the location of the user or wearer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Jayaraman et al with a position and joint monitoring system, as taught by Stark et al, so that the movement of the wearer can be interpreted and monitored along with the location of the user or wearer.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 6,958,045 Takiguchi et al discloses a gait detection system, gait detection apparatus device and gait detection method

U.S. Pat. No. 5,853,005 Scanlon discloses an acoustic monitoring system

U.S. Pat. No. 5,197,488 Kovacevic discloses a knee joint load measuring instrument and joint prosthesis

U.S. Pat. No. 6,198,394 Jacobsen et al discloses a system for remote monitoring of personnel

U.S. Pat. No. 6,701,296 Kramer et al discloses strain-sensing goniometer systems and recognition algorithms

U.S. Pat. No. 6,757,557 Bladen et al discloses a position location system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew D. Dryden whose telephone number is (571) 272-6266. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on (571) 272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MDD

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